

Conference Paper

Neuropsychological Test Barcelona-2: Theoretical and Practical Aspects

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Abstract

The Barcelona test (TB) is an instrument of neuropsychological assessment, developed under the influence of Luria's ideas, and published in 1990 [1]. It explores the main cognitive functions and allows the design of graphic profiles similar to those of the Boston Test for the diagnosis of aphasia. Objective: To present the theoretical and practical characteristics of a new version of the test, the Test Barcelona-2. The new and computerized versions of test structure is described here with six modules established: (1) Language-attention-orientation; (2) Reading and writing; (3) Motor-praxis; (4) Perception-gnosis; (5) Memory; (6) Abstraction-execution. As a novelty, test allows the selection for specific profiles: alpha, beta, abbreviated, aphasia, and ecological-forensic approach. The types of variables condition a different statistical approach and a differentiated form of graphic expression. The new test presents a modular structure, which allows determining intra- and inter-module dissociations. Computerization greatly facilitates the work of the clinician. In the case of aphasia the test allows to differentiate easily all its clinical forms.

Keywords: Test Barceona-2, neuropsychological test; computerized workstation, modular structure.

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Received: 25 July 2018

Accepted: 9 August 2018

Published: 1 November 2018

Publishing services provided by
Knowledge E

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Selection and Peer-review under the responsibility of the Fifth International Luria Memorial Congress Conference Committee.

1. Introduction

The first version, Test Barcelona (TB) was published in 1990. It is an instrument of neuropsychological research, developed by Prof. Jordi Peña Casanova under the influence of Luria's ideas. With this test, it is possible to explore the basic cognitive functions and to create graphical profiles similar to the Boston test for the diagnosis of aphasia. The

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new, modular version of test of test Barcelona-2 is ready in both traditional (paper-based) and computerised versions (included in workstation) are ready and their manual on Spanish is will be available in spring of 2018. The test itself is translated into several languages, including Catalanian, English, French and Russian.

2. Methodology

This paper provides a brief description of the new version and computerized workstation of the neuropsychological test Barcelona-2. It includes analysis of the test structure of a new design version [manual, protocols, patient' sheets] and its computerization version. Standardization was performed on a sample consisted of 331 participants (128 men and 203 women, with a mean age of 58 years, and an average schooling of 11.4 years).

3. Results

3.1. Structure of test Barcelona-2

3.1.1. Main versions of the test Barcelona-2

There are two main versions of the test Barcelona-2: 1) a traditional one (paper and pencil) and 2) digitalised or computerised one. The latter is incorporated within a workstation test Barcelona together with other tests as Neuronorma [2], for example, and can be used on personal computer or tablet (see "Fig. 1").

As a novelty, test allows the selection for specific profiles: alpha, beta, abbreviated, aphasia, and ecological-forensic approach.

3.1.2. Modules of the test Barcelona-2

Six modules were established in the test of Barcelona: (1) Language-attention-orientation; (2) Reading and writing; (3) Motor-praxis; (4) Perception-gnosis; (5) Memory; (6) Abstraction-execution.

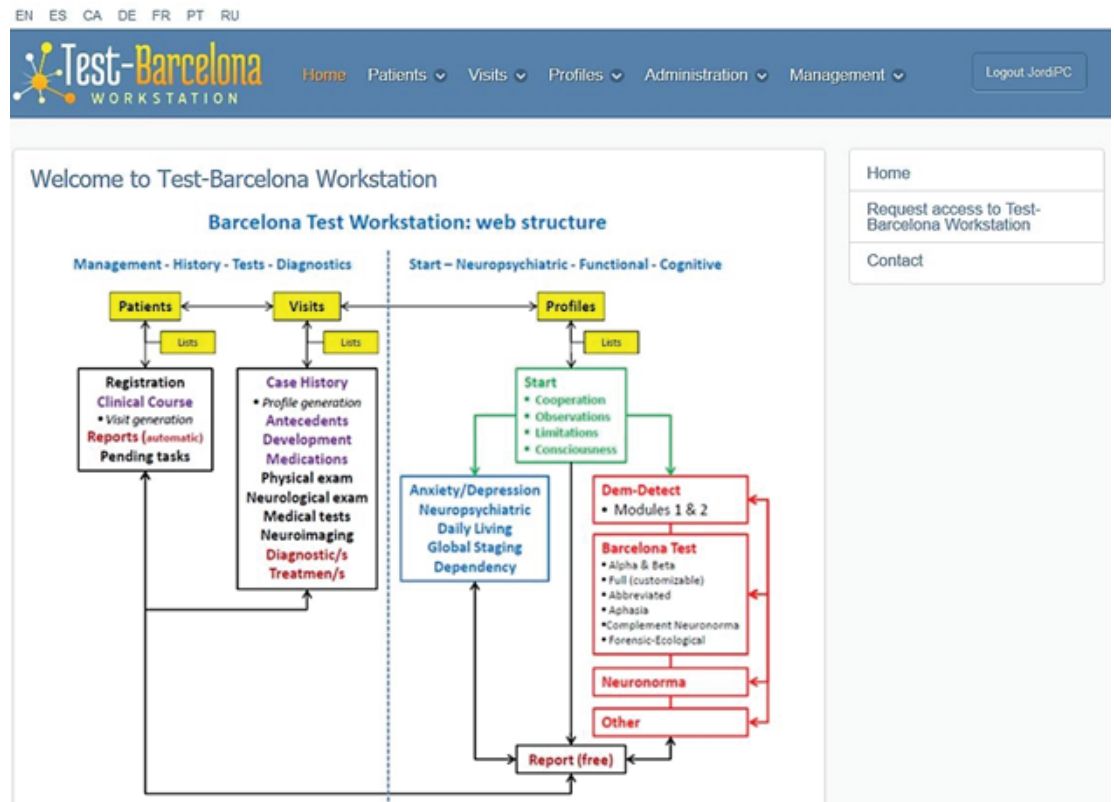


Figure 1: The computerised workstation Barcelona-2.

3.1.3. Types of variables used

Two types of variables have been differentiated: (1) dichotomous variables (of Luria type), and (2) Gaussian variables (continuous or with distribution). The scores have been scaled: from N – Normal to L/C – “a questionable limit” or border value between normal and non-normal one. The severity of non-normal performance is ranged from Easy levels (L1 and L2), Medium (M1 and M2) and Strong (G1 and G2) (“Fig.2”).

3.1.4. Examples of use in practice

The novelty of the test Barcelona-2 is in its capability to realise different tests o modules separately which is more efficient in the practical work. Here you can see the example (“Fig.3”) of the patient’s profile with a two-way anomia. His comprehension (below scores in the profile) was severely damaged.

Barcelona Test-2 Summary Profile

Version of the Barcelona Test-2: **Customizable** Edition type: **Normal**

Module 1. Oral language - Orientation - Attention

Module version: **Full**

Update **Delete**

Neuropsychological test	Raw score	Clinical Cat.	Severe (<3)		Mod. (3-5)		Discrete (6-9)		LC	Percentiles: apply in case of variables with distribution										
			G2	G1	M2	M1	L2	L1		10	20	30	40	50	60	70	80	≥90		
Speech (basic conversation)	(0 - 8)		G2	G1	M2	M1	L2	L1	LC										N	
Aphasia: severity	(0 - 6)		G2	G1	M2	M1	L2	L1	LC										N	
Aphasia: fluency	(0 - 6)		G2	G1	M2	M1	L2	L1	LC										N	
Aphasia: informat. content	(0 - 6)		G2	G1	M2	M1	L2	L1	LC										N	
Prosody: rhythm	(0 - 3)		G2	G1	M2	M1	L2	L1	LC										N	
Prosody: melody	(0 - 3)		G2	G1	M2	M1	L2	L1	LC										N	
Orientation: person	(0 - 25)		G2	G1	M2	M1	L2	L1	LC										N	
Orientation: place	(0 - 25)		G2	G1	M2	M1	L2	L1	LC										N	
Orientation: time	(0 - 70)		G2	G1	M2	M1	L2	L1	LC										N	
Digits: forward	(0 - 9)		G2	G1	M2	M1	L2	L1	10	20	30	40	50	60	70	80	≥90			
Digits: backward	(0 - 8)		G2	G1	M2	M1	L2	L1	10	20	30	40	50	60	70	80	≥90			
Autom. sequences: forward	(0 - 9)		G2	G1	M2	M1	L2	L1	LC									N		
Autom. sequences: forward-t	(0 - 15)		G2	G1	M2	M1	L2	L1	LC									N		

Figure 2: The modules of the test Barcelona-2 (here on the example – module 1).

Fluent language

Severity: mild

Prosody: normal

Automatic series: normal

Oral praxis: normal

Repetition: Normal

Anomia
(+ no recognition of the word)

Comprehension:
Lexical: mild
Supralexical: moderate

Neuropsychological test	Raw score	Clinical Cat.	G2	G1	M2	M1	L2	L1	10	20	30	40	50	60	70	80	≥90	
Speech (basic conversation)	6	L2	G2	G1	M2	M1	L2	L1	LC									N
Aphasia: severity	4	L2	G2	G1	M2	M1	L2	L1	LC									N
Aphasia: fluency	4	L2	G2	G1	M2	M1	L2	L1	LC									N
Aphasia: informat. content	4	L2	G2	G1	M2	M1	L2	L1	LC									N
Prosody: rhythm	3	N90	G2	G1	M2	M1	L2	L1	LC									N
Prosody: melody	3	N90	G2	G1	M2	M1	L2	L1	LC									N
Autom. sequences: forward	9	N90	G2	G1	M2	M1	L2	L1	LC									N
Autom. sequences: backward	9	N90	G2	G1	M2	M1	L2	L1	LC									N
Orofacial praxis	20	N90	G2	G1	M2	M1	L2	L1	LC									N
Repetition: syllables	10	N90	G2	G1	M2	M1	L2	L1	LC									N
Repetition: pairs of syllables	10	N90	G2	G1	M2	M1	L2	L1	LC									N
Repetition: pseudowords	10	N90	G2	G1	M2	M1	L2	L1	LC									N
Repetition: words minimal pairs	9	N10	G2	G1	M2	M1	L2	L1	LC									N
Repetition: words	10	N90	G2	G1	M2	M1	L2	L1	LC									N
Repetition: sentences-whole	9	N10	G2	G1	M2	M1	L2	L1	LC									N
Repetition: sentences-words	63	L1	G2	G1	M2	M1	L2	L1	LC									N
Naming: objects	9	G1	G2	G1	M2	M1	L2	L1	LC									N
Naming: actions	6	G1	G2	G1	M2	M1	L2	L1	LC									N
Naming: body parts	9	G2	G2	G1	M2	M1	L2	L1	LC									N
Naming: responsive naming	7	M1	G2	G1	M2	M1	L2	L1	LC									N
Naming: closure naming	9	L1	G2	G1	M2	M1	L2	L1	LC									N
Comprehension: words	8	L2	G2	G1	M2	M1	L2	L1	LC									N
Comprehension: body parts	8	L2	G2	G1	M2	M1	L2	L1	LC									N
Comprehension: commands	4	G1	G2	G1	M2	M1	L2	L1	LC									N
Comprehension: sentences	2	M2	G2	G1	M2	M1	L2	L1	LC									N

... Two way anomia

Figure 3: The individual patient's profile, module Aphasia of the workstation Barcelona-2.

4. Conclusions

The new test presents a modular structure, which allows determining intra- and inter-module dissociations. Computerization greatly facilitates the work of the clinician. In the case of aphasia the test allows to differentiate easily all its clinical forms.

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